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| 10/616,341 | 07/09/2003 | Richard Allen Day | END920010118US2 (IEN-10-5) | 1504 |
| 26681 | 7590 | 08/09/2005 | EXAMINER | |
| DRIGGS, LUCAS, BRUBAKER & HOGG CO. L.P.A. 38500 CHARDON ROAD DEPT. IEN WILLOUGHBY HILLS, OH 44094 | | | BROWN, JAYME L | |
| | | | ART UNIT | PAPER NUMBER |
| | | | 1733 | |

DATE MAILED: 08/09/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

10/616,341

Applicant(s)

DAY ET AL.

Examiner

Jayme L. Brown

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 09 July 2003.
- 2a) ☐ This action is FINAL. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-15 is/are pending in the application.
- 4a) Of the above claim(s) 11 and 14 is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-10, 12-13, and 15 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☒ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 09 July 2003 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. _____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- 1) ☐ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☒ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)
Paper No(s)/Mail Date 7/9/03.
- 4) ☐ Interview Summary (PTO-413)
Paper No(s)/Mail Date. _____.
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other: _____.

DETAILED ACTION

Election/Restrictions

1. This application contains claims directed to the following patentably distinct species of the claimed invention:

Species A – drawn to the roughened surfaces being roughened by treating the copper surface with an oxide or an oxide replacement process (appears to read on claims 10-15).

Species B – drawn to the roughened surfaces being roughened by having plated thereon zinc, brass, nickel or chrome (appears to read on claims 10 and 13).

*upon election of Species A, Applicant must make a further sub-species election:

sub-species Ai – drawn to the surface having a second roughness created by applying a photoresist material to the voltage plane, then exposing and developing the photoresist to reveal the surface to have said second roughness, then treating said second surface to provide the desired surface roughness, then removing the photoresist (appears to read on claims 11 and 14).

sub-species Aii – drawn to the surface having a second roughness created by applying a masking material to all of the areas of the voltage plane that are not to have said second roughness, then roughening those areas not covered by the masking material to have said second roughness (appears to read on claims 12 and 15).

Applicant is required under 35 U.S.C. 121 to elect a single disclosed species for prosecution on the merits to which the claims shall be restricted if no generic claim is finally held to be allowable. Currently, claims 1-9 are generic.

Applicant is advised that a reply to this requirement must include an identification of the species that is elected consonant with this requirement, and a listing of all claims readable thereon, including any claims subsequently added. An argument that a claim is allowable or that all claims are generic is considered nonresponsive unless accompanied by an election.

Upon the allowance of a generic claim, applicant will be entitled to consideration of claims to additional species which are written in dependent form or otherwise include all the limitations of an allowed generic claim as provided by 37 CFR 1.141. If claims are added after the election, applicant must indicate which are readable upon the elected species. MPEP § 809.02(a).

Should applicant traverse on the ground that the species are not patentably distinct, applicant should submit evidence or identify such evidence now of record showing the species to be obvious variants or clearly admit on the record that this is the case. In either instance, if the examiner finds one of the inventions unpatentable over the prior art, the evidence or admission may be used in a rejection under 35 U.S.C. 103(a) of the other invention.

2. During a telephone conversation with Mr. William Hogg on August 1, 2005 a provisional election was made without traverse to prosecute the invention of Species A, sub-species Aii, claims 10, 12-13, and 15. Affirmation of this election must be made by

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applicant in replying to this Office action. Claims 11 and 14 are withdrawn from further consideration by the examiner, 37 CFR 1.142(b), as being drawn to a non-elected invention.

3. Applicant is reminded that upon the cancellation of claims to a non-elected invention, the inventorship must be amended in compliance with 37 CFR 1.48(b) if one or more of the currently named inventors is no longer an inventor of at least one claim remaining in the application. Any amendment of inventorship must be accompanied by a request under 37 CFR 1.48(b) and by the fee required under 37 CFR 1.17(i).

Information Disclosure Statement

4. The information disclosure statement (IDS) submitted on 7/9/03 has been considered by the examiner.

Specification

5. The disclosure is objected to because of the following informalities:

On page 1, line 6: add in - - 6,596,384 - - after "Patent No.".

On page 8, lines 3 and 5: item 33 is referred to as "hole", "copper", and "copper plating". It appears in the drawings that item 33 is the copper plating. In line 3, "33" should be deleted after "hole", and in line 5, insert - - plating - - after copper.

On page 7, line 2, item 25 is referred to as "top surface 25" and on page 8, line 14, it is referred to as "roughened surfaces 25". On page 7, lines 2-3, "The lands 16

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each have a top surface 25 which is maintained in the roughened condition" should be changed to - - The lands 16 each have a top roughened surface 25 - -.

Appropriate correction is required.

Claim Rejections - 35 USC § 112

6. The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

7. Claims 1-10, 12-13 and 15 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

Claim 1 is indefinite because the claim language is not consistent with the terminology utilized in the specification. It is entirely unclear what Applicant is trying to claim, and prior art cannot be applied to the claim until this matter has been resolved.

For instance, the claim refers to a first layer having a substrate of dielectric material having a conductive signal plane whereas the specification interchangeably refers to a signal layer and signal plane as element 10 in the figures and considers the dielectric material 15 as part of the signal layer/signal plane, not separate from it (Spec. page 6, lines 13-17). Is the dielectric material part of the signal layer/plane or separate from it? The claim and specification are inconsistent.

The claim refers to selectively roughening at least a portion of said first surface to form a second surface having a second roughness. It is unclear what "said first surface" is. Is it the dielectric material? The signal lines? The signal lands? Or a combination

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thereof? The specification appears to teach selectively roughening a top surface (25) of the signal lands so they are rougher than the top surface of the signal lines (18) (Spec. page 6, line 19 – page 7, line 4). Is this what Applicant is attempting to claim? The current wording does not convey such as⁴ is entirely unclear as to what is being roughened. Prior art cannot be applied to the claims until these issues have been resolved.

Claim 2 recites the limitation "said portion of said second surface" in line 16 on page 13. There is insufficient antecedent basis for this limitation in the claim. It is recommended that the claim be changed to read as such:

- - The invention as defined in claim 1 wherein said second surface of said signal plane includes said lands surrounding said plated through holes. - -

Claim 3 recites the limitation "said second portion" in line 20 on page 13. There is insufficient antecedent basis for this limitation in the claim. The claim should also define whether it is the first roughness or second roughness in line 19. It is recommended that the claim be changed to read as such:

- - The invention as defined in claim 2 wherein said second roughness of said signal plane has an R_z value greater than about 3 microns. - -

Regarding claim 4, the roughness should be clarified as to if it is the first roughness or the second roughness in line 1 on page 14. It is recommended that the claim be changed to read as such:

- - The invention as defined in claim 2 wherein the first roughness of said at least one surface of said signal plane has an R_z value of less than about 1 micron. - -

Claims 5-7 recite the limitation "said first portion of said signal plane" in lines 5, 9, and 13 on page 14. There is insufficient antecedent basis for this limitation in the claim.

Claim 8 recites the limitation "the first portion of said signal lines" in lines 16-17 on page 14. There is insufficient antecedent basis for this limitation in the claim.

Regarding claim 10 and 13, it is unclear whether the term "said roughened surfaces" encompasses all surfaces with either a first or second roughness. It needs to be clarified as to what surfaces the treatments are being done to.

Regarding claims 12 and 15, the term "those areas" needs to be clarified. As written now, these claims currently state that a masking material is applied to all areas of the voltage plane that are not to have a second roughness, but then these same areas are said to be roughened. It is recommended that these claims be rewritten to read as such:

- - The invention as defined in claim 1 (or 8 for claim 15) wherein said surface having said second roughness is created by, applying a masking material to all areas of said voltage plane that are not to have said second roughness, then roughening all unmasked areas to have said second roughness. - -.

Also regarding claim 12, it discusses creating a second roughness by applying a masking material to the voltage plane. This claim is dependent on claim 1 wherein the second roughness in claim 1 is on a surface of the signal plane. It is recommended that this claim either be changed to be dependent on claim 8 or that "said voltage plane" be changed to - - said signal plane - -.

Conclusion

8. Any inquiry concerning this communication or earlier communications from the examiner should be directed to **Jayme L. Brown** whose telephone number is **571-272-8386**. The examiner can normally be reached on M-F.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Blaine Copenheaver can be reached on 571-272-1156. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

Jayme L. Brown

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John T. Haran
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PRIMARY EXAMINER